

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY



(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)



Applicant's or agent's file reference SB05-02	FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. PCT/KR2005/000036	International filing date(day/month/year) 07 JANUARY 2005 (07.01.2005)	Priority date (day/month/year) 17 MARCH 2004 (17.03.2004)
International Patent Classification (IPC) or national classification and IPC H01L 33/00(2006.01)i		
Applicant OPTOWAY, Inc. et al		

- This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 5 sheets, including this cover sheet.
- This report is also accompanied by ANNEXES, comprising:
 - ☒ (sent to the applicant and to the International Bureau) a total of 4 sheets, as follows:
 - ☒ sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
 - ☒ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
 - ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____ containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box relating to Sequence Listing (see Section 802 of the Administrative Instructions).
- This report contains indications relating to the following items:
 - ☒ Box No. I Basis of the report
 - ☐ Box No. II Priority
 - ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - ☐ Box No. IV Lack of unity of invention
 - ☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - ☐ Box No. VI Certain documents cited
 - ☒ Box No. VII Certain defects in the international application
 - ☐ Box No. VIII Certain observations on the international application

Date of submission of the demand 05 JANUARY 2006 (05.01.2006)	Date of completion of this report 23 JUNE 2006 (23.06.2006)
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Form PCT/IPEA/409 (cover sheet) (April 2005)

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International application No.

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Box No. 1 Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

- ☐ This report is based on translations from the original language into the following language _____ which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on (replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):

- ☐ the international application as originally filed/furnished
- ☒ the description:
 pages 1-10 _____ as originally filed/furnished
 pages* _____ received by this Authority on _____
 pages* _____ received by this Authority on _____
- ☒ the claims:
 pages 11-12 _____ as originally filed/furnished
 pages* _____ as amended (together with any statement) under Article 19
 pages* _____ received by this Authority on _____
 pages* _____ received by this Authority on _____
- ☒ the drawings:
 pages 4/5 _____ as originally filed/furnished
 pages* 1/5-3/5, 5/5 _____ received by this Authority on January 13, 2006
 pages* _____ received by this Authority on _____
- ☐ the sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets _____
- ☐ the sequence listing (specify): _____
- ☐ any table(s) related to sequence listing (specify): _____

4. ☒ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☒ the drawings, sheets 2-4, 6-9, 12
- ☐ the sequence listing (specify): _____
- ☐ any table(s) related to sequence listing (specify): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims 1-16	YES
	Claims NONE	NO
Inventive step (IS)	Claims 7-16	YES
	Claims 1-6	NO
Industrial applicability (IA)	Claims 1-16	YES
	Claims NONE	NO

2. Citations and explanations (Rule 70.7)

(1) The documents cited in the International Search Report:

D1 : US 2001/0048113 A1 D2 : US 6504180 B1
D3 : US 2003/0062530 A1 D4 : KR 2005-0003671 A

(2) Inventive Step

The subject-matter of claims 1-6 is about an LED device in which an ultra-fine prominence and depression structure is provided on a part of the p-type or n-type semiconductor layer.

But, D1 discloses a surface-emitting light-emitting diode having increased light emission characteristics. The surface-emitting light-emitting in D1 includes a substrate, an active layer, an upper and a lower clad layer formed on and below the active layer respectively, a lower contact layer, and an upper contact layer formed on the light generating layer and having an uneven surface portion (The abstract, figures 1-9 and claim 1). And the shape of the uneven surface is also described in D1. According to D1, the light is condensed by the uneven surface portion formed on the p-type semiconductor layer and thus the amount of light which is totally reflected internally is reduced.

In addition, D2 discloses a light emitting device having a waveguide surface structure extending in two dimensions and having a roughened surface structure (122 in figure 12) with a random grating structure.

As mentioned above, the features of claims 1-6 are included among the several straightforward possibilities or combinations from which a skilled person could select without an exercise of the inventive skill.

Therefore, the subject matter of claims 1-6 lacks an inventive step under PCT Article 33(3).

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Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

The drawings of figures 2-4 and 6-8 are not clear.

They are not properly explaining the invention nor coincided to the description of the invention.

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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of:

BOX I.

This amendment which was filed on January 13, 2006 goes beyond the disclosure in the international application as filed.
Therefore, this is considered to violate PCT Article 34.

BOX V.

However, the technical features of claims 7-16 of this application are not disclosed in D1 nor in D2, so it is believed that the subject matter of claims 7-16 has an inventive step under PCT Article 33(3).

(3) Industrial Applicability

The present application is believed to be industrially applicable according to PCT Article 33(4).